

## TENSILE STRENGTH OF MATERIALS OBTAINED BY ELECTRIC PULSE CONSOLIDATION OF POWDERS

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**Key Words:** electric pulse consolidation, strength of the material, small specimens, Brazilian test, bending of a thin disk on a ring support.

A wide range of products of modern technology, obtained by electropulse consolidation of powders, has dimensions that do not exceed 10-15 mm in diameter, and their thickness varies from 1 to 10 mm. Standard mechanical testing methods for such sample sizes are often not applicable.

The article investigates the possibility of determining the resistance to fracture of materials obtained from powders by electric pulse consolidation method using the test method for bending thin disks on an annular support and testing short cylinders according to the "Brazilian test". A numerical simulation of the process of bending a thin disk on an annular support and compression of a short cylinder according to the "Brazilian test" scheme has been carried out.

Techniques are verified by testing small-sized thin disks and short cylinders made of gray cast iron and graphite. It is revealed a difference in the nature of the destruction of cast iron samples (plastic failure) and samples of graphite (brittle fracture). The good correspondence of the characters of destruction of graphite samples and samples produced from powders by the electric pulse consolidation is shown. The results of comparative studies of the tensile strength of compacts of nano and ultrafine alumina powders with a spherical shape of particles obtained by the SPS method are presented.

The influence of various additives and manufacturing technology of materials on the resistance of the material to brittle fracture is revealed. The effect of the thickness of the cylinders on the strength of aluminum oxide  $Al_2O_3$  is investigated.

The possibility of determining the tensile strength of materials obtained by consolidating from powders using the electric pulse method by bending small-sized thin disks on an annular support, and short cylinders using the "Brazilian test" scheme is demonstrated.